

Fixed SILpoint Gas Alarm Devices of the SP1 series with Ex db protection for Zone 1 and 2. SP2 series with Ex nA protection only for Zone 2. Designed for the continuous monitoring of the ambient air to detect toxic gases and vapours for use in the hazardous areas of zones 1 and/or 2 according to Directive 2014/34/EU.

Microprocessor based gas sensor with 4–20 mA / RS485 Modbus output signal, alarm and fault relays (all SIL2 certified) for monitoring the ambient air to detect combustible gases and vapours by means of a catalytic sensor element (Pellistor).

The calibration of sensors without LCD display is carried out via the calibration device STL06-PGX2 or the PC soft-ware PCE06-PGX2. Sensors with LCD display have an integrated calibration routine that is started from the outside by a permanent magnet without opening the housing. In case of an alarm or failure the backlight of sensors with LCD display changes from green to red.

Key Features

- ATEX and IEC Ex certificates
- Metrological test & SIL2 safety functions 4–20 mA, RS485 and relay
- **SP1 for zone 1 (and also suitable for zone 2):**
 - Type “Ex db” with flame-proof enclosure
- **SP2 for zone 2:**
 - Type “Ex nA” with flame-proof enclosure
- Enclosure: additional FM and CSA certificate for Class I, Div. 1
- Continuous monitoring
- Microprocessor with 12-bit converter resolution
- Self-monitoring system
- Easy calibration
- Calibration service by exchanging the sensor head
- Proportional 4–20 mA output
- Serial interface to the control center
- Reverse polarity protection
- Overload protection
- LCD display with status LEDs (optional)
- Alarm and fault signal relay (optional)



SENSOR WITH ALARM



SENSOR WITHOUT DISPLAY

Application

The SILpoint sensor is used in industrial areas like oil/gas industry, biogas plants, petrochemical industry, power plants etc. in Ex-Zone 1 (SP1) and/or 2 (SP2). The SILpoint sensor is also suitable for commercial areas like gas transfer stations etc. With the 4–20 mA / RS485-ModBus output signal the sensor is suitable for connection to the Combi series, as well as to any other controllers or automation devices. Optionally, the SILpoint sensor is also available with LCD display and relay output.

GENERAL SPECIFICATIONS

ELECTRICAL	
Power supply SP1 series	20–28 V DC reverse polarity protected
Power supply SP2 series	20–28 V DC reverse polarity protected or 24 V AC \pm 10 % (21.6–26.4 V AC)
Power consumption (at 24 V DC)	90 mA, max. 130 mA
Control unit	Microprocessor with 12-bit converter resolution
Digital filter	Averaging in order to increase the EMC immunity
Visual indications	3 LEDs for power, alarm and fault
Analog output signal (active)	Proportional, overload and short-circuit proof, load \leq 500 Ω 4–20 mA = measuring range 3.0–4 mA = underrange > 20–21,2 mA = overrange 2 mA = fault > 21.8 mA = fault High
Serial output (optional)	Serial data bus
Faulty relay output (optional)	Max. 30 V AC/DC, 1 A
Alarm relay (optional)	Max. 30 V AC/DC, 1 A
LCD (optional)	2 x 16 characters, 3 status LEDs, 4 menu operating elements
SENSOR DATA	
Gas type and measuring range	Toxic gases & oxygen
Sensor element	Electrochemical
Measuring range	See Ordering Information
Sensor data	See tables
Stabilization time	24 h
Warm-up time	Measuring mode after 30 s or 10 s (CO, O ₂), 60 s (N ₂), 300 s (NH ₃)
Storage time ¹	Max. 6 months
Poisoning	Sensors are susceptible to poisoning by organic solvents and silicone vapours.
SENSOR HEAD HOUSING	
Material	CrNi Stahl: 1.4404
Dimensions (d x H)	30 x 56 mm (1.18 x 2.20 in.)
Protection class	Gas inlet IP64, with option splash proof IP66 SplashGuard (on request)
Thread	External thread NPT 3/4" ANSI/ B1.20.1
PHYSICAL CHARACTERISTICS	
Enclosure P1 and P3 / colour	Aluminium pressure die-casting / light grey RAL 7032, epoxy coating
Dimensions (d x H) / weight	95 x 82 mm / approx. 1.3 kg
Protection class	Housing protection IP66 to IP68 (depending on the cable glands used)
Mounting	Wall mounting (sensor head downwards)
Cable entry	1x resp. 3x 3/4 in. (Ansi B1.20.1)
Wire connection	Spring-type terminal, 0.08 to 2.5 mm ² AWG 28–12
Wire length	Max. load 500 Ω (= wire resistance + controller input resistance)

ENVIRONMENTAL CONDITIONS (OPERATION AND EXPLOSION PROTECTION)

Humidity	20 to 90% RH (not condensing)
Operating temperature	-25 °C to +60 °C (-13 °F to 140 °F), -20 °C to +60 °C (-4 °F to 140 °F) for display version
Storage temperature	-5 °C to +30 °C (23 °F to 86 °F)
Pressure range ²	800 to 1200 mbar (80 to 120 kPa)
Air velocity	< 6 m/sec.

1 We recommend recalibrating the devices if stocked for a longer period (> 8 weeks).

2 The explosion protection test only covers the pressure range up to 1100 mbar and the oxygen concentration up to 21 % vol.

MARKING / CERTIFICATES	SP1	SP2
ATEX Marking	II2G Ex db IIC T4 Gb, CE 0158	II3G Ex nA IIC T4 Gc
EC-Type Examination Certificate	BVS 15 ATEX E 129 X	
Protection types	EN 60079-0: 2012 and EN 60079-1: 2014 (Ex-db)	EN 60079-0: 2012 and EN 60079-15: 2011 (Ex-nA)
Measurement function	EN 60079-29-1 (pending)	
Certificates	IECEx BSV 16.0038 X (electrical Ex protection), IEC 60079-0, -1 (Ex db)	
Functional safety SIL2 (only Pellistors)	EN 50271: 2010; EN 50402: 2016 and EN 61508: 2011 (parts 1-3)	

Certificates only housing

FM Certificate	Class 3600, Class 3615, Class 3810, ANSI/NEMA 250. Explosionproof for Class I, Division 1, Groups A, B, C and D; dust-ignition-proof for Class II, Division 1, Groups E, F and G, Class III, hazardous (classified) locations, indoors and outdoors (type 4X).
CSA Certificate	2472857 / Class 2258-02 PROCESS CONTROL EQUIPMENT for hazardous locations Class I, Div. 1, Groups A, B, C and D; Class II, Div. 1, Groups E, F and G, Class III, Div. 1; Type 4X

WARRANTY

	1 year on sensor (not if poisoned or overloaded), 2 years on device
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SPECIFICATIONS SENSOR ELEMENT

GAS TYPE	ORDERING NO.	MEASURING RANGE	ACCURACY	DISPLAY RESOLUTION	REPEATABILITY	T90 TIME	ZERO-POINT VARIATION	DRIFT IN AIR		TEMPERATURE RANGE	PRESSURE RANGE	HUMIDITY RANGE (NON-CONDENSING)	LIFE TIME ¹ IN AIR	RELATIVE GAS DENSITY ²	CALIBRATION INTERVAL ¹
								ZERO	GAIN						
	PX2-SX1-	ppm	± % sig.	ppm	<± % sig.	≤ sec.	±ppm	< % signal/month		°C	kPa	% RH	> months	Air = 1	Months
CO	E1110-CX	0-150	2	0.1	5	40	4	0.4	0.4	-20 / +50	80-120	10-95	72	0.97	12
CO	E1110-EX	0-250	2	0.1	5	40	4	0.4	0.4	-20 / +50	80-120	10-95	72	0.97	12
CO	E1110-FX	0-300	2	0.1	5	40	4	0.4	0.4	-20 / +50	80-120	10-95	72	0.97	12
CO	E1110-HX	0-500	2	0.1	5	40	4	0.4	0.4	-20 / +50	80-120	10-95	72	0.97	12
NH ₃	E1125-AX	0-100	5	0.1	10	200	5	1	2	-30 / +50	80-120	15-90	24	0.60	12
NH ₃	E1125-BX	0-300	3	0.1	10	200	5	1	2	-30 / +50	80-120	15-90	24	0.60	12
NH ₃	E1125-CX	0-500	3	0.1	10	200	5	1	2	-30 / +50	80-120	15-90	24	0.60	12
NH ₃	E1125-DX	0-1000	3	1	10	200	10	1	2	-30 / +50	80-120	15-90	24	0.60	12
NH ₃	E1125-EX	0-5000	2	1	10	120	100	1	2	-30 / +50	90-110	15-90	24	0.60	12
NO ₂	E1130-EX	0-100	5	0.1	2	120	2	1	2	-30 / +50	80-120	15-90	24	2.80	12
HCN	E1183-BX	0-50	5	0.01	5	40	2	1	2	-20 / +50	90-110	15-90	24	0.93	6
HCN	E1183-CX	0-100	5	0.1	5	60	2	1	2	-20 / +50	90-110	15-90	24	0.93	6
HCl	E1186-DX	0-20	5	0.01	5	60	0.5	1	2	-20 / +50	90-110	15-90	24	1.27	6
H ₂ S	E1197-AX	0-50	3	0.01	2	60	1	1	2	-30 / +50	90-110	15-90	24	1.19	12
H ₂ S	E1197-BX	0-100	3	0.1	5	60	1	1	2	-30 / +50	90-110	15-90	24	1.19	12
H ₂ S	E1197-CX	0-200	3	0.1	5	60	2	1	2	-30 / +50	90-110	15-90	24	1.19	12
H ₂ S	E1197-DX	0-500	3	0.1	5	60	5	1	2	-30 / +50	90-110	15-90	24	1.19	12
H ₂ S	E1197-EX	0-1500	3	1	5	90	15	n.d.	n.d.	-30 / +50	90-110	15-90	24	1.19	12
		%Vol													
O ₂	E1195-A2/3	0-25	2	0.01	n.d.	30	n.d.	n.d.	0.4/0.6	-40 / +50	80-120	5-95	24/36	1.11	6/6
O ₂	E1195-A5/7	0-25	2	0.01	n.d.W	30	n.d.	n.d.	0.4/0.6	-40 / +50	80-120	15-90	60/84	1.11	12/12

1 Manufacturer-recommended calibration interval for normal environmental conditions

2 The sensor must be installed at the correct height depending on the relative gas density (d):

$d < 0.95$: Mount on the ceiling

$0.95 < d < 1.05$: Mount at a height of 1.5–1.8 m above floor

$d > 1.05$: Mount at a height of 0.3 m above floor

Exception NO₂: Mounting height for NO₂ sensors: 0.5–1.8 m above floor!

3 Exceeding the measuring range limit will include a risk of damaging the sensor element.

CROSS SENSITIVITY¹ - SENSOR ELEMENT

Illustration: Gas concentration of cross gas / reaction of sensor

GAS TYPE	ORDERING NO.	CHLORINE, Cl ₂	ETHANOL, C ₂ H ₆ O	ETHYLENE, C ₂ H ₄	CARBON MONOXIDE, CO	CARBON DIOXIDE, CO ₂	SULPHUR DIOXIDE, SO ₂	HYDROGEN SULPHIDE, H ₂ S	NITROGEN DIOXIDE, NO ₂	NITROGEN MONOXIDE, NO	HYDROGEN, H ₂
	PX2- SX1-	ppm	ppm	ppm	ppm	ppm	±ppm	ppm	ppm	ppm	ppm
CO	E1110-XX ²	2/0	2000/5			5000/0	50/0,5	25/0	50/-1	50/8	100/20
NH ₃	E1125-AX	10/0	100/0	100/0	200/0	5000/0	10/<10	10/<20	20/<2	20/0	1000/-10
NH ₃	E1125-BX	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
NH ₃	E1125-CX	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
NH ₃	E1125-DX	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
NH ₃	E1125-EX	10/0	100/0	500/0	400/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
NO ₂	E1130-XX ²	1/1	100/0	100/0	100/2	5000/0	30/-0.6	20/-25		50/0	1000/0
HCN	E1183-XX ²			100/0	1000/0	5000/0	20/38	15/25	5/-12	35/0	100/2
HCl	E1186-DX	20/0			100/2		100/0	20/31	20/-6	25/0	
H ₂ S	E1197-XX ²						100/20		5/1	35/2	100/20
O ₂	E1195-XX ²					5 % vol					

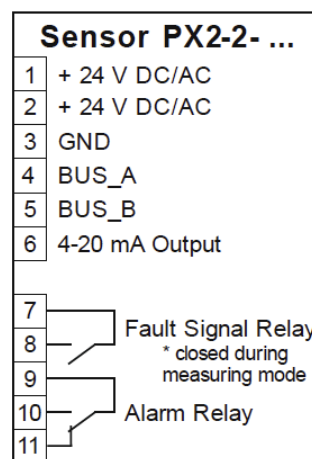
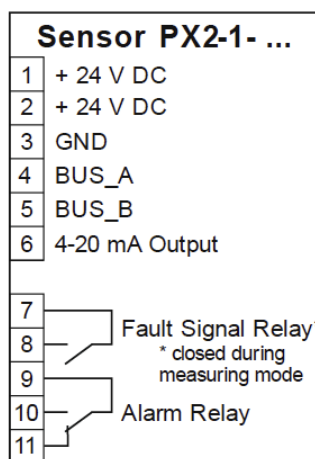
1 The table does not claim to be complete. Other gases, too, can have an influence on the sensitivity. The mentioned cross sensitivity data are only reference values valid for new sensors.

2 Cross sensitivities valid for all measuring ranges of the sensor.

All specifications were collected under optimal test conditions.

We confirm compliance with the minimum requirements of the applicable standard.

ELECTRICAL CONNECTION



ORDERING INFORMATION

PX2-SX1-	X-1-	X-	EXXXX-XX- EXXXX-XX	XX	SENSOR		
					EXCHANGE HEAD ¹		
				P1	Aluminum die-cast housing for 1x cable entry incl. cable gland	Sensor housing	
				P3	Aluminum die-cast housing for 3x cable entries incl. 1x gland		
				Gas type	Measuring range		
			E1110-CX	Carbon monoxide, CO	El. Chem.	0-150 ppm	
			E1110-EX	Carbon monoxide, CO	El. Chem.	0-250 ppm	
			E1110-FX	Carbon monoxide, CO	El. Chem.	0-300 ppm	
			E1110-HX	Carbon monoxide, CO	El. Chem.	0-500 ppm	
			E1125-AX*	Ammonia, NH ₃	El. Chem.	0-100 ppm	
			E1125-BX*	Ammonia, NH ₃	El. Chem.	0-300 ppm	
			E1125-CX*	Ammonia, NH ₃	El. Chem.	0-500 ppm	
			E1125-DX*	Ammonia, NH ₃	El. Chem.	0-1000 ppm	
			E1125-EX*	Ammonia, NH ₃	El. Chem.	0-5000 ppm	
			E1130-EX	Nitrogen dioxide, NO ₂	El. Chem.	0-100 ppm	
			E1183-BX	Hydrogen cyanide, HCN	El. Chem.	0-50 ppm	
			E1183-CX	Hydrogen cyanide, HCN	El. Chem.	0-100 ppmW	
			E1186-DX	Hydrogen chloride, HCl	El. Chem.	0-20 ppm	
			E1197-AX	Hydrogen sulphide, H ₂ S	El. Chem.	0-50 ppm	
			E1197-BX	Hydrogen sulphide, H ₂ S	El. Chem.	0-100 ppm	
			E1197-CX	Hydrogen sulphide, H ₂ S	El. Chem.	0-200 ppm	
			E1197-DX	Hydrogen sulphide, H ₂ S	El. Chem.	0-500 ppm	
			E1197-EX	Hydrogen sulphide, H ₂ S	El. Chem.	0-1500 ppm	
			E1195-A2	Oxygen – 2 years, O ₂	El. Chem.	0-25 % vol	
			E1195-A3	Oxygen – 2 years, O ₂	El. Chem.	0-25 % vol	
			E1195-A5	Oxygen – 2 years, O ₂	El. Chem.	0-25 % vol	
			E1195-A7	Oxygen – 2 years, O ₂	El. Chem.	0-25 % vol	
		0	Without options				Options ATEX Zone
		1	Relay set (2)				
		2	LC Display				
		3	Relay set (2) and LC Display				
	1	Zone 1 and 2					Gas type/ range
	2	Zone 2					

* Only on request

¹ The exchangeable sensor head is only to be used in connection with the SILpoint Gas Sensor. Otherwise it loses its ATEX Certification.